REMARKS:

PRIORITY

The Examiner states that a claim for priority from provisional application 60/192,097 filed 3/24/2000 cannot be based on 35 USC 119(e) since the present application was filed more than twelve months thereafter. In response the Applicants note that the present application, as filed, claims priority from provisional application 60/250,081 filed November 29, 2000 (see page 1, lines 13-15). The present application was filed on April 13, 2001, which is less than twelve months thereafter. Consequently, the Applicants submit that the present application is entitled to a priority claim to provisional application 60/250,081.

DRAWING OBJECTIONS AND AMENDMENTS

The Examiner objected to FIG. 2A of the drawings for including the reference sign **200A**, which is mentioned in the description. In response the Applicants have amended the first paragraph on page 5 to refer to this reference sign (see below).

The Examiner objected to FIGs. 3A, 5A and 6 of the drawings for respectively failing to include the reference signs 316, 515 and 604, which are mentioned in the description. In response, the Applicants have amended FIG. 3A to include the sidewall electrode 316 and its reference sign. The Applicants submit there is adequate support for the sidewall electrode 316 in the specification at page lines 1-27. Thus the amendment to FIG. 3A merely makes explicit that which was implicit in the application as originally filed. Therefore, no new matter has been added by this

amendment. The Applicants have also amended FIGs. 5A and 6 to include the appropriate reference signs.

The Applicants have also amended FIG. 5A to remove extraneous lines as shown in red. These lines were apparently introduced inadvertently in the process of rendering the drawings electronically. The Applicants submit that this amendment serves merely to render the drawing in a more formal manner. Thus no new matter has been added with this amendment.

The Examiner has objected to the drawings under 37 CFR 1.84(p)(4) since the reference character "410" refers to both a flap and a reflective surface. In response, the Applicants have amended FIG. 4F so that the reference character "413" refers to a reflective surface. Thus, the reference character "410" refers only to the flap.

SPECIFICATION OBJECTIONS AND AMENDMENTS

The Examiner has objected to the specification in two places because of informalities. In response, the Applicants have made amendments to the specification to correct these informalities. Specifically, the Applicants have made the following specification amendments:

At page 5, line 9, "**200**" has been changed to --**200A**--;

at page 11, line 23, "**405**" has been changed to --**404**--; and

at page 13, line 1, "**410**" has been changed to --**413**--.

The Applicants have also amended the specification at page 1, line 12 to include the serial number of the parent case to the present application and to remove the agent's docket

number. The Applicants submit that these amendments merely adopt the Examiner's suggestions and add no new matter.

CLAIM REJECTIONS 35 USC 102

The Examiner has rejected claims **1**, **2** and **4-7** under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,770,465 to MacDonald et al. (hereinafter MacDonald). In rejecting the claims, the Examiner argues that MacDonald discloses a method for forming a microstructure starting with a single crystal silicon substrate base (10) (col. 3, lines 52-53). A trench (14) is anisotropically etched in the substrate base (10) (Co. 3, lines 65-67). A first insulating oxide layer (16) is formed on the wafer (Col. 4, lines 8-10). A second layer (18) is used to cover the oxide layer (16) and fill the trench (14)(col. 4, lines 14-17). The trench filling material may be a metal conducting layer (col. 2 lines 19-23). A portion of the base material adjacent to the trench (14) is removed by etching (col. 11, lines 35-37). Referring to Figure 11d, the trench (262) is further defined under a flap (276).

The Examiner has also rejected claims **1** and **5-7** as being anticipated by U.S. Patent 5,719,073 to Shaw et al. (hereinafter Shaw). In rejecting the claims, the Examiner argues that Shaw discloses a method for forming an isolated electrode starting with a single crystal silicon substrate base (10) (col. 8, lines 55-56). Trenches (22) are anisotropically etched in the substrate base (10) (col. 9, lines 55-56). An insulating oxide (28) is formed on the wafer (col. 10, lines 60-63). A conducting layer (44) is formed over the oxide layer covering both the sidewalls and the surface of the base (col. 12, lines 22-25). A portion

of the base material adjacent to the trenches (22) is removed by etching (col. 11, lines 35-37).

The Applicants respectfully traverse the rejections. Claim **1** clearly recites "etching one or more trenches in a *backside* of the base" (emphasis added). Neither MacDonald nor Shaw teaches or suggests such a feature. Instead both Shaw and MacDonald do all of their processing on the front or top of a wafer (see MacDonald col. 9, lines 50-53, and Shaw. The distinction may be shown by comparing, e.g., Figs. 11a-11g of MacDonald with FIGs. 4A-4I of the present application. In Figs. 11a-11g of MacDonald show the formation of trenches 260, 262, 263 in a *top* surface of a substrate 264. Furthermore, all of the etch processes that MacDonald describes are performed on the same side of the substrate.

Similarly, Shaw teaches a *single mask process* for forming high aspect ratio mechanical structures (see abstract and col 4, lines 22-40).

To illustrate the difference in etching the backside and etching the front side, note that in FIGs. 4A-4I of the present application the trenches 404 are formed on one side of the wafer 400 (the backside) and the flap 410 is formed on the other side (the front side). Neither Shaw nor MacDonald etches trenches (or anything else) on *both* sides of a wafer. Thus, nowhere in Shaw or MacDonald is there the slightest suggestion of etching a wafer from the *backside* to form the trenches as recited in claim **1**. Therefore, neither MacDonald nor Shaw teaches or suggests all the limitations of claim **1** as it presently stands in the application. As such claim **1** defines an invention

suitable for patent protection. Furthermore, claims **2**, and **4-7** depend, either directly or indirectly, from claim **1** and recite additional features therefore. As such and for the same reasons set forth with respect to claim **1**, the Applicants submit that these dependent claims define an invention suitable for patent protection.

CLAIM REJECTIONS - 35 USC 103.

Macdonald in view of Yao

The Examiner has rejected claim **3** under 35 USC 103(a) as being unpatentable over MacDonald in view of U.S. Patent 6,074,890 to Yao et al. (hereinafter Yao). In rejecting claim **3**, the Examiner states that MacDonald discloses the invention substantially as claimed, but does not use an etch stop layer to etch the trench in the base. The Examiner argues that since Yao teaches the use of an etch stop layer for etching a substrate at col. 5., lines 58-59. It would have been obvious to apply the etch stop layer taught by Yao during the preliminary etching step of MacDonald in order to define the depth of the trench.

Shaw in view of Yao

The Examiner has also rejected claims **2**, **3** under 35 USC 103(a) as being unpatentable over Shaw in view of Yao. With respect to claim **2**, the Examiner states that Shaw discloses the invention substantially as claimed, but does not define the trench under a flap. The Examiner argues that since Yao teaches forming a trench under a flap at col. 7, lines 16-18 it would have been obvious to form the trench of Shaw under a suspended flap as taught by Yao in order to form an electromechanical structure.

With respect to claim **3**, the Examiner states that Shaw does not use an etch stop layer to etch the trench in the base. The Examiner argues that since Yao teaches the use of such an etch stop layer it would have been obvious to apply such an etch stop layer during Shaw's preliminary etching step in order to define the depth of the trench.

Shaw in view of Brosnihan

The Examiner has rejected claim **4** under 35 USC 103(a) as being unpatentable over Shaw as applied to claim **1** above in view of U.S. Patent 6,121,552 to Brosnihan et al. (hereinafter Brosnihan). The Examiner states that Shaw discloses the invention substantially as claimed, but does not fill the trench completely with a conducting layer. The Examiner states that Brosnihan teaches covering the sidewall of a trench (18) with an insulating layer (64) and subsequently filling the trench with a conductor (66) (col. 6, lines 38-42). The Examiner concludes that it would have been obvious to completely fill the trench of Shaw as shown by Brosnihan in order to form an isolated electrode.

MacDonald in view of Bartha, Shaw in view of Bartha

The Examiner has rejected claims **8** and **9** under 35 USC 103(a) as being unpatentable over MacDonald or Shaw as applied to claims **1**, **2** and **4-7** above in view of U.S. Patent 5,960,255 to Bartha et al. (hereinafter Bartha). The Examiner states that Macdonald and Shaw disclose the invention substantially as claimed, but that neither teaches the orientation of the crystal base and sidewall. The Examiner argues that Bartha teaches the use of a single crystal material that has a <110> surface orientation with vertical trenches oriented parallel to the <111> planes.

The Examiner concludes that it would have been obvious to etch the trench of MacDonald or Shaw using the crystal orientation shown by Bartha in order to form trench with straight and parallel sides that form a 90° angle with the base.

The Applicants respectfully traverse all of the rejections on the grounds that none of the cited combinations teaches all of the features of any of the rejected claims. All of the rejections rely on combinations involving either Shaw or MacDonald as a primary reference. As set forth above, the Applicants submit that the Examiner has not pointed to any teaching or suggestion in Shaw, MacDonald tending to show "etching one or more trenches in a *backside* of the base" as set forth in claim **1** (emphasis added). Furthermore, the Examiner has pointed to no teaching or suggestion in any of the other references tending to show this feature. As such, no combination of the references as set forth by the Examiner recites all of the limitations of claim **1**. As such, the Applicants submit that claim **1** is not obvious over any of combinations of references that the Examiner has cited. Therefore, claim **1** defines an invention suitable for patent protection.

Furthermore, claims **2**, and **4-7** depend, either directly or indirectly, from claim **1** and recite additional features therefore. As such and for the same reasons set forth with respect to claim **1**, the Applicants submit that these dependent claims define an invention suitable for patent protection.

CONCLUSION

For the reasons set forth above, the Applicants submit that claims **1-9** are not anticipated by and unobvious over the cited art and define an invention suitable for patent protection. Furthermore, the Applicants submit that the above amendments to the drawings and specification and accompanying remarks remove the stated objections. The Applicants respectfully request entry of the amendment reconsideration of the application and that the Examiner issue a Notice of Allowance in the next office action.

Respectfully submitted,

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